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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,941	02/28/2002	John Terry	NC17586	4377

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EXAMINER

TSE, YOUNG TOI

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,941

Applicant(s)

TERRY, JOHN

Examiner

YOUNG T. TSE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: the reference sign "22" is not labeled in Figure 1 as mentioned on page 9, line 17 of the specification. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 5 is objected to because of the following informalities: in claim 5, line 6, "selected interleaved symbol coordinates" should be – the selected interleaved symbol coordinates --. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites an apparatus comprising a coordinate interleaver is a single means claim. A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor. See MPEP 2164.08(a). Wherein the dependent claims 2-15 are depended upon claim 1.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. In claim 11, line ~~7~~² (both occurrences) and line 5, the phrase "the receiving station" lacks antecedent basis.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 8-9, 11-16 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al..

Chen et al. (US Patent No. 6,304,581 B1) discloses a communication system providing a transmitter apparatus 100 in Figure 1 for interleaving data symbols of a block of data symbols having data symbols from B(1) to B(n).

Referring to Figure 1, the transmitter apparatus 100 comprises an orthogonal transmit diversity (OTD) interweaver 105 for interleaving encoded symbols 104 from a convolutional/turbo encoder 103 to generate interleaved symbols 106, a transmit signal processing block 107 for transmitting the interleaved symbols 106 into data symbols 108 pass through a data splitter 109 to produce two streams of data symbols 110 and 111, the data symbols are modulated independently in QPSK modulators 112 and 113

and up-converted to an appropriate carrier frequency before transmission from antennas 114 and 115 (column 2, lines 6-27).

Figure 2 shows one embodiment of a multi-carrier (MC) CDMA communication system having an OTD MC interleaver; Figure 3 show one embodiment of an OTD interleaver; and Figure 4 shows another embodiment of an OTD MC interleaver.

With respect to claims 1 and 16, for instance, in Figure 3 of the CDMA communication system, the interleaver 300 interleaving the encoded input symbols 104 into a block of data symbols 301 that includes data symbols from $B(1)$ to $B(n)$. The data symbols 301 are selected and divided into a first group (first coordinate) and a second group (second coordinate) of the data symbols 303 and 304. The first group of the data symbols 303 includes data symbols $B(1)$ to $B(n/2)$ and the second group of the data symbols 304 includes data symbols $B(n/2+1)$ to $B(n)$ (column 5, lines 6-19).

With respect to claims 2-3, the QPSK modulators 112 and 113 and the antennas 114 and 115 correspond to the transmit/space diversity creator to cause the interleaver symbols and up-convert the data symbols to a communication channel.

With respect to claims 8-9, 11-15, and 18, it is well known in a CDMA communication system art comprising a base station having a transceiver and a mobile station having a transceiver for transmitting data symbols to the base station and receiving data symbols from the base station. Although a receiver apparatus is not shown in the drawings, Chen clearly teaches that reading the interleaved data from both ends (beginning and end) on a receiving side, for example Mobile station, to de-interleave the incoming data stream, the Mobile station needs to go through the same

procedures in a reverse order (column 7, lines 34-37). Therefore, it is well known in the art that a receiver apparatus includes a de-interleaver followed by a decoder.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-5, 10 and 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al..

With respect to claims 4-5 and 17, Chen fails to show or suggest that the encoded input symbols inputted to the interleaver are provided from a Radon-Hurwitz encoder. Although Chen uses a convolutional/turbo encoder to provide the encoded input symbols into the interleaver. A Radon-Hurwitz encoder is simple one type of encoders, it is not patentable by using a well known type encoder for generating encoded symbols without any specific goal to an interleaver. Therefore, it would have been obvious to one of ordinary skill in the art to use a Radon-Hurwitz encoder in Chen's convolutional/turbo encoder in order to provide the choice of design of Radon-Hurwitz encoded symbols to the interleaver.

With respect to claim 10, it is obvious to one of ordinary skill in the art to use time division multiplexing scheme in Chen's communication system since the communication system is a CDMA communication system.

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10. Claims 6-7 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Simon et al..

With respect to claims 6-7 and 19-20, although Chen does not explicitly show or suggest that the encoded symbols are trellis-coded symbols.

Simon et al. (US Patent No. 4,945,549) discloses a communication system in Figure 1 comprising a transmission circuit and a receiver circuit. The transmitter circuit includes a trellis encoder 10 for transmitting trellis coded symbols to an interleaver 11. The receiver circuit comprises a trellis decoder 26 for decoding data symbols generated from a de-interleaver 24.

Again, as discussed in claims 4-5 and 17, a trellis encoder is simple one type of encoders, it is not patentable by using a well known type encoder for generating encoded symbols without any specific goal to an interleaver. Therefore, it would have been obvious to one of ordinary skill in the art to use a trellis encoder in Chen's convolutional/turbo encoder in order to provide the choice of design of trellis encoded symbols into the interleaver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Young Tse** whose telephone number is **(703) 305-4736**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Jay Patel**, can be reached at **(703) 308-7728**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

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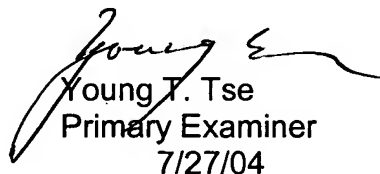
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.


Young T. Tse
Primary Examiner
7/27/04